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CLAIMS:

1. Method for controlling an up-converter (100) having an input (2) for receiving an alternating input voltage (MAINS), the up-converter (100) further having an output (3), the method comprising the steps of:
providing an inductor (5) and a diode (6) connected in series with said output (3);
5 providing a capacitor (8) connected in parallel to said output (3);
providing a controllable switch (7) having one switch terminal coupled to a node between the inductor (5) and the diode (6);
feeding the inductor (5) with a rectified AC voltage (V_i) derived from said alternating input voltage (MAINS);
10 generating a switch control signal (S_C) having a substantially constant repetition frequency and a varying pulse width (T_H), for switching said switch (7) open and closed;
generating a first measuring signal (S_o) representing the output voltage (V_o) at said output (3);
sampling the first measuring signal (S_o) at a first predetermined sampling frequency;
15 digitally processing the sampled first measuring signal (S_o) to calculate the pulse width (T_H) of the switch control signal (S_C) such that the output voltage (V_o) remains substantially constant; and
setting the pulse width (T_H) in accordance with the calculation result.
- 20 2. Method according to claim 1, wherein the said processing of the sampled first measuring signal (S_o) and the said calculation of the pulse width (T_H) is performed by a software program running in a suitably programmed controller (110).
3. Method according to claim 1, wherein the pulse width (T_H) is updated at a
25 predetermined updating frequency.
4. Method according to claim 1, further comprising the steps of generating a second measuring signal (S_i) representing said rectified AC voltage (V_i);

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sampling the second measuring signal (Si) at a second predetermined sampling frequency, which preferably is equal to the first predetermined sampling frequency, the second measuring signal (Si) and the first measuring signal (So) preferably being sampled simultaneously;

- 5 wherein the pulse width (T_H) of the switch control signal (S_C) is calculated in accordance with the following formula:

$$T_H = K \sqrt{\frac{V_o - V_i}{V_o}}$$

wherein K is a multiplication constant depending on device parameters.

- 10 5. Method according to claim 1, wherein the first predetermined sampling frequency is substantially equal to the said repetition frequency of the control signal (S_C).
6. Method according to claim 1, wherein the up-converter (100) is part of a driver (300A; 300B) for a gas discharge lamp.
- 15 7. Method according to claim 1, wherein the input (2) of the up-converter (100) is connected to mains.
8. Up-converter (110), comprising:
- 20 an input (2) for receiving an alternating input voltage (MAINS);
an output (3);
a rectifier (4) having its input connected to said input (2), and having an output providing a rectified AC voltage (V_i);
an inductor (5) and a diode (6) connected in series with the output (3), the inductor having a
25 first terminal (5a) coupled to said output of said rectifier (4) and having a second terminal (5b) coupled to said diode (6);
a capacitor (8) connected in parallel to the output (3);
a switch (7) having one switch terminal coupled to a node between the inductor (5) and the diode (6);
- 30 a digital processor (110) having a first input (118) coupled to receive a first measuring signal (S_o) representing the output voltage (V_o) at said output (3), and further having a control output (117) coupled to a control terminal of said switch (7);

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the digital processor (110) being adapted:

- to generate at its control output (117) a switch control signal (S_C) having a pulse width (T_H) and a substantially constant repetition frequency, for switching the switch (7) open and closed;
- 5 – to sample the first measuring signal (S_o) at a first predetermined sampling frequency, which preferably is equal to the said repetition frequency;
- to digitally process the sampled first measuring signal (S_o) to calculate the pulse width (T_H) of the switch control signal (S_C) such that the output voltage (V_o) remains substantially constant;
- 10 – and to set the pulse width (T_H) of the switch control signal (S_C) in accordance with the calculation result.

9. Up-converter according to claim 8, wherein the digital processor (110) comprises a software program running to perform at least the step of calculating the pulse
15 width (T_H) of the switch control signal (S_C).

10. Up-converter according to claim 8, wherein the digital processor (110) further comprises a second input (114) coupled to receive a second measuring signal (S_i) representing the said rectified AC voltage (V_i);
20 the digital processor (110) being adapted to sample the second measuring signal (S_i) at a second predetermined sampling frequency, which preferably is equal to the said first sampling frequency, the digital processor (110) preferably being adapted to sample the second measuring signal (S_i) simultaneously with the first measuring signal (S_o);
the digital processor (110) being adapted to calculate the pulse width (T_H) of the switch
25 control signal (S_C) in accordance with the following formula:

$$T_H = K \sqrt{\frac{V_o - V_i}{V_o}}$$

wherein K is a multiplication constant depending on device parameters.

11. Driver (300A; 300B) for a gas discharge lamp, comprising an up-converter
30 (100) according to claim 8.